

REMARKS

Claims 13-19 are pending.

**Issues Under 35 U.S.C. § 102**

The rejection of claims 14-16 in paragraph 2 of the last Office Action as anticipated under 35 U.S.C. § 102 by US patent 5,783,489 (Kaufman) is traversed. One of the features of the process as defined in these claims is the use of intermediate alumina in addition to abrasive. As described at page 20, lines 5-13 of the specification as filed, intermediate alumina indicates alumina particles other than  $\alpha$ -alumina particles, e.g.,  $\gamma$ -alumina,  $\delta$ -alumina,  $\theta$ -alumina,  $\eta$ -alumina,  $\kappa$ -alumina. By the use of intermediate alumina, the present invention exhibits the effects of an increase in the polishing rate and a reduction in the surface roughness of the polished object. These effects are clearly evident by comparing Example No. II-1 with Comparative Example No. II-5 in Tables 2 and 3. Since  $\gamma$ -alumina is used as intermediate alumina instead of alumina sol, unexpectedly superior results are exhibited in polishing rate and surface roughness in Example No. II-1.

Furthermore, the effects of intermediate alumina are also clearly shown by comparing Example No. III-1 with Comparative

Example No. III-3 in Tables 4 and 5. Since intermediate alumina is further used in Example No. III-1, unexpectedly superior results are exhibited in polishing rate and surface roughness. Kaufman, to the contrary, provides only a general disclosure of metal oxide abrasives. Kaufman fails to teach the use of intermediate alumina together with an abrasive as in the present invention. Neither does Kaufman teach the effects thereof.

Claim 14, specifies both Compound (A) and Compound (B). Specifically, roll-off is improved by Compound (A), as shown on page 22, lines 21-25 of the specification as filed, while polishing rate is increased by Compound (B), as shown on page 23, lines 1-2 of the specification, as filed. In Tables 4 and 5, it is clearly shown that roll-off is improved. Example III-1 compared with Comparative Example III-2 (without any Compound (A)), shows that polishing rate is increased in Example III-1 compared with Comparative Example III-4 (without any Compound (B)). Accordingly, the unexpected results of using both Compound (A) and Compound (B) is clearly demonstrated in the specification as filed.

Kaufman, on the other hand, provides only a general disclosure of organic acids. Kaufman fails to teach either the use of both Compound (A) and Compound (B) or the effects thereof. Accordingly, pending claim 14 is not anticipated by Kaufman and is not obvious in view of Kaufman.

The rejection of claims 17-19 in paragraph 3 of the last Office Action as anticipated by Kaufman is traversed. As explained above, in claim 17, it is one of the features to use both Compound (A) and Compound (B). In Table 5, by comparing Example IV-1 with Comparative Example IV-2, it is clearly shown that roll-off is improved by the present invention. Since Kaufman fails to teach this feature, pending claim 17 is neither anticipated nor rendered obvious by Kaufman.

***Issues Under 35 U.S.C. § 103***

The rejection of claims 13-16 over Kaufman in view of US patent 6,037,260 (Tsai) in paragraphs 4-6 of the last Office Action is traversed on the grounds that it would not be obvious to the skilled artisan to combine the teachings of these two references. Furthermore even if the teachings were combined the result would still not be subject matter within the scope of that claimed.

The deficiencies of Kaufman are not supplied by Tsai.

The Examiner argues that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to incorporate Tsai's  $\theta$  phase aluminum oxide,  $\delta$  phase aluminum oxide, or  $\gamma$  phase aluminum oxide, which are the same as Applicants' intermediate alumina, into Kaufman's polishing composition for the purpose of stabilizing the suspension

properties of the slurry by altering the rheology of the polishing slurry into that of a thixotropic substance. The contrary is true.

It would not be obvious to combine Tsai with Kaufman. According to Tsai, column 2, lines 8-12, a key point in the invention of Tsai is based on the fact that the behavior of boehmite, a hydroxide of aluminum, pseudoboehmite or mixtures thereof is altered into that of a thixotropic substance by incorporating a suitable acidic material. Thereby, all the aluminum oxides that can be dispersed in an organic acid can be used (see column 3, lines 4-11). That is, since the behavior of boehmite, etc., is altered into that of thixotropic substance, all the aluminum oxides can be used. Whereas, Kaufman does not disclose the use of boehmite, a hydroxide of aluminum, pseudoboehmite or mixtures thereof. Accordingly, one skilled in the art would not be motivated to alter the rheology of the polishing slurry of Kaufman into that of a thixotropic substance. The skilled artisan never would be motivated to combine Kaufman with Tsai.

In the claims of Tsai, it is defined that "aluminum oxide ( $\text{Al}_2\text{O}_3$ ) selected from the group consisting of  $\theta$  phase aluminum oxide,  $\delta$  phase aluminum oxide,  $\gamma$  phase aluminum oxide and mixtures thereof" is used. However, Tsai fails to clearly disclose a combination of abrasives such as  $\alpha$ -alumina with intermediate

alumina such as  $\theta$ -alumina,  $\delta$ -alumina and  $\gamma$ -alumina. In the examples of Tsai, each of  $\theta$ -  $\text{Al}_2\text{O}_3$ ,  $\delta$ -  $\text{Al}_2\text{O}_3$ , and  $\gamma$ -  $\text{Al}_2\text{O}_3$  is used alone. The combination as used in the present invention is not disclosed. Accordingly, the present invention would not be obvious over these references even if they were combined.

CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact David R. Murphy (Reg. No. 22,751) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Appl. No. 09/842,769


If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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